

REMARKS

Applicants have amended claims 1, 3, 6-7, 17, and 19-20, and have canceled claims 2, 5, 10, 12-16, and 18 during prosecution of this patent application. Applicants are not conceding in this patent application that said amended and canceled claims are not patentable over the art cited by the Examiner, since the claim amendments and cancellations are only for facilitating expeditious prosecution of this patent application. Applicants respectfully reserve the right to pursue said amended and canceled claims, and other claims, in one or more continuations and/or divisional patent applications.

The Examiner rejected claim 5 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner rejected claims 1, 3, 7-9, 11, 12, 17 and 19 under 35 U.S.C. § 102(b) as allegedly being anticipated by Deacon *et al.*, US Patent 5,792,269.

The Examiner rejected claims 1, 3, 7, 12, 17 and 19 under 35 U.S.C. § 102(b) as allegedly being anticipated by Carpenter *et al.*, US Patent 6,821,347 B2.

The Examiner rejected claim 4 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Deacon *et al.*, US Patent 5,792,269, in view of Plavidal *et al.*, US Patent 5,718,795.

The Examiner rejected claims 5 and 10 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Deacon *et al.*, US Patent 5,792,269.

The Examiner rejected claims 6 and 20 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Deacon *et al.*, US Patent 5,792,269, in view of Mitani *et al.*, JP 3-281780.

Applicants respectfully traverse the § 112, § 102 and § 103 rejections with the following

arguments.

35 U.S.C. § 112, Second Paragraph

The Examiner rejected claim 5 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Since claim 5 has been canceled, Applicants respectfully contend that the rejection of claim 5 under 35 U.S.C. § 112, second paragraph is moot.

35 U.S.C. § 102(b)

The Examiner rejected claims 1, 3, 7-9, 11, 12, 17 and 19 under 35 U.S.C. § 102(b) as allegedly being anticipated by Deacon *et al.*, US Patent 5,792,269.

Claims 1, 3, 7-9, 11, and 12

Since claim 12 has been canceled, Applicants respectfully contend that the rejection of claim 12 under 35 U.S.C. § 102(b) is moot.

Applicants respectfully contend that Deacon does not anticipate claim 1, because Deacon does not teach each and every feature of claim 1.

As a first reason why Deacon does not anticipate claim 1, Deacon does not teach the feature:

“wherein each channel of the N_1 channels of a first kind are configured to provide a first fluid to flow into the chamber at a constant angle θ_1 with respect to an exposed surface of the distribution plate,

wherein each channel of the N_2 channels of the second kind are configured to provide a second fluid to flow into the chamber at a constant angle θ_2 with respect to the exposed surface of the distribution plate, and

wherein θ_1 and θ_2 are each at least 45 degrees and less than 90 degrees,

wherein θ_1 is unequal to θ_2 ”.

In the embodiment of FIG. 7A, Deacon teaches only one predetermined angle and therefore does not teach both θ_1 and θ_2 wherein θ_1 is unequal to θ_2 . See Deacon, col. 4, lines 46-49 (“FIG. 7A shows a cross section of faceplate 40 with gas distribution holes oriented at a **predetermined angle** (e.g. 36 degrees) relative to the surface of the faceplate and the surface of

the wafer.” (emphasis added)).

In another embodiment, Deacon teaches using different angles within the same ring and therefore does not satisfy the feature of angle θ_1 being constant throughout all rings of the first type and of angle θ_2 being constant throughout all rings of the second type. See Deacon, col. 8, lines 8-13 (“we used a circular pattern of holes in which one half of the circle included 36 degree holes and the other half included 72 degree holes, with the gas flow being directed away from a centerline where the two semi-circles of holes met”).

Therefore, Deacon does not anticipate claim 1.

As a second reason why Deacon does not anticipate claim 1, Deacon does not teach the feature:

“a first fluid feed line configured to be connected to a source of the first fluid, wherein the first fluid feed line is fluidically coupled to the N_1 channels of the first kind for providing the first fluid to the N_1 channels of the first kind, and wherein the first fluid feed line is not fluidically coupled to the N_2 channels of the second kind and cannot provide the first fluid to the N_2 channels of the second kind; and

a second fluid feed line configured to be connected to a source of the second fluid and to be fluidically coupled to the N_2 channels of the second kind so as to provide the second fluid to the N_2 channels of the second kind, and wherein the second fluid feed line is not fluidically coupled to the N_1 channels of the first kind and cannot provide the second fluid to the N_2 channels of the first kind”.

Deacon teaches only one inlet (just below “GAS/RF”) in Deacon, FIG. 2 for directing gas to the distribution plate 30. Deacon does not teach the first and second fluid feed lines for controlling the selective introduction of the first and second fluids into the rings of the first and

second types, respectively, as recited in claim 1.

Therefore, Deacon does not anticipate claim 1.

Based on the preceding arguments, Applicants respectfully maintain that Deacon does not anticipate claim 1, and that claim 1 is in condition for allowance. Since claims 3, 7-9, and 11 depend from claim 1, Applicants contend that claims 3, 7-9, and 11 are likewise in condition for allowance.

Claims 17 and 19

Applicants respectfully contend that Deacon does not anticipate claim 17, because Deacon does not teach each and every feature of claim 17.

As a first reason why Deacon does not anticipate claim 17, Deacon does not teach the feature:

“wherein each channel of the N_2 channels of the second kind are configured to provide a second fluid to flow into the chamber at a constant angle θ_2 with respect to the exposed surface of the distribution plate, ...

wherein θ_1 and θ_2 are each at least 45 degrees and less than 90 degrees,

wherein θ_1 is unequal to θ_2 ”.

In the embodiment of FIG. 7A, Deacon teaches only one predetermined angle and therefore does not teach both θ_1 and θ_2 wherein θ_1 is unequal to θ_2 . See Deacon, col. 4, lines 46-49 (“FIG. 7A shows a cross section of faceplate 40 with gas distribution holes oriented at a **predetermined angle** (e.g. 36 degrees) relative to the surface of the faceplate and the surface of

the wafer.” (emphasis added)).

In another embodiment, Deacon teaches using different angles within the same ring and therefore does not satisfy the feature of angle θ_1 being constant throughout all rings of the first type and of angle θ_2 being constant throughout all rings of the second type, subject to θ_1 being unequal to θ_2 . See Deacon, col. 8, lines 8-13 (“we used a circular pattern of holes in which one half of the circle included 36 degree holes and the other half included 72 degree holes, with the gas flow being directed away from a centerline where the two semi-circles of holes met”).

Therefore, Deacon does not anticipate claim 17.

As a second reason why Deacon does not anticipate claim 1, Deacon does not teach the feature: “wherein three consecutive rings of the I rings are denoted as rings R_K , R_{K+1} , R_{K+2} and are arranged in an alternating pattern such that either rings R_K and R_{K+2} are rings of the first type and ring R_{K+1} is a ring of the second type or rings R_K and R_{K+1} are rings of the second type and ring R_{K+2} is a ring of the first type, subject to K being selected from the group consisting of 1, 2, ... , and I-2”.

Based on the preceding arguments, Applicants respectfully maintain that Deacon does not anticipate claim 17, and that claim 17 is in condition for allowance. Since claim 19 depends from claim 17, Applicants contend that claim 19 is likewise in condition for allowance.

35 U.S.C. § 102(b)

The Examiner rejected claims 1, 3, 7, 12, 17 and 19 under 35 U.S.C. § 102(b) as allegedly being anticipated by Carpenter *et al.*, US Patent 6,821,347 B2.

Claims 1, 3, 7, and 12

Since claim 12 has been canceled, Applicants respectfully contend that the rejection of claim 12 under 35 U.S.C. § 102(b) is moot.

Applicants respectfully contend that Carpenter does not anticipate claim 1, because Carpenter does not teach each and every feature of claim 1.

For example, Carpenter does not teach the feature:

“a first fluid feed line configured to be connected to a source of the first fluid, wherein the first fluid feed line is fluidically coupled to the N₁ channels of the first kind for providing the first fluid to the N₁ channels of the first kind, and wherein the first fluid feed line is not fluidically coupled to the N₂ channels of the second kind and cannot provide the first fluid to the N₂ channels of the second kind; and

a second fluid feed line configured to be connected to a source of the second fluid and to be fluidically coupled to the N₂ channels of the second kind so as to provide the second fluid to the N₂ channels of the second kind, and wherein the second fluid feed line is not fluidically coupled to the N₁ channels of the first kind and cannot provide the second fluid to the N₂ channels of the first kind”.

Although Carpenter teaches the use of multiple gasses, Carpenter teaches only one inlet 122 in Carpenter, Fig. 4 for directing gas to the distribution plate 170. Carpenter does not teach the first and second fluid feed lines for controlling the selective introduction of the first and second fluids into the rings of the first and second types, respectively, as recited in claim 1.

Therefore, Carpenter does not anticipate claim 1.

Based on the preceding arguments, Applicants respectfully maintain that Carpenter does not anticipate claim 1, and that claim 1 is in condition for allowance. Since claims 3 and 7 depend from claim 1, Applicants contend that claims 3 and 7 are likewise in condition for allowance.

Claims 17 and 19

Applicants respectfully contend that Carpenter does not anticipate claim 17, because Carpenter does not teach each and every feature of claim 17.

For example, Carpenter does not teach the feature:

“wherein each channel of the N_2 channels of the second kind are configured to provide a second fluid to flow into the chamber at a constant angle θ_2 with respect to the exposed surface of the distribution plate, ...

wherein θ_1 and θ_2 are each at least 45 degrees and less than 90 degrees,

wherein θ_1 is unequal to θ_2 ...

wherein three consecutive rings of the I rings are denoted as rings R_K , R_{K+1} , R_{K+2} and are arranged in an alternating pattern such that either rings R_K and R_{K+2} are rings of the first type and ring R_{K+1} is a ring of the second type or rings R_K and R_{K+1} are rings of the second type and ring R_{K+2} is a ring of the first type, subject to K being selected from the group consisting of 1, 2, ... , and I-2”.

In the embodiment of FIG. 5, Carpenter teaches an angle between 15 and 85 degrees through the first passageways 172a, but also teaches an angle of 90 degrees through the second passageways 172b, and therefore does not teach the feature of “wherein θ_1 and θ_2 are each at least 45 degrees and less than 90 degrees”. See Carpenter, col. 5, lines 58-59 (“The second

passageways 172b extend through the plate 170 generally **normal** to the first surface 171a” (emphasis added)).

In the embodiment of FIG. 6, Carpenter teaches a constant angle and therefore does not teach the feature of “wherein θ_1 is unequal to θ_2 ”. See Carpenter, col. 57, lines 4-5 (“In this embodiment, all of the passageways 172 are canted **at the same angle**.” (emphasis added)).

In the embodiment of FIG. 7, Carpenter teaches a first angle α for the first passageways 172a in the consecutive rings in the inner region 173a, and a second angle β for the second passageways 172b in the consecutive rings in the outer region 173b. Therefore Carpenter does not teach the alternating ring pattern recited in the feature of “wherein three consecutive rings of the I rings are denoted as rings R_K , R_{K+1} , R_{K+2} and are arranged in an alternating pattern such that either rings R_K and R_{K+2} are rings of the first type and ring R_{K+1} is a ring of the second type or rings R_K and R_{K+2} are rings of the second type and ring R_{K+1} is a ring of the first type, subject to K being selected from the group consisting of 1, 2, ..., and $I-2$ ”. See Carpenter, FIGS. 1 and 7; col. 7, lines 18-21 (“In this embodiment, the first passageways 172a at the inner region 173a are canted at a first angle α and the second passageways 172b in the second region 173b are canted at a second angle β ”).

Therefore, Carpenter does not anticipate claim 17.

Based on the preceding arguments, Applicants respectfully maintain that Carpenter does not anticipate claim 17, and that claim 17 is in condition for allowance. Since claim 19 depends from claim 17, Applicants contend that claim 19 is likewise in condition for allowance.

35 U.S.C. § 103(a)

Claim 4

The Examiner rejected claim 4 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Deacon *et al.*, US Patent 5,792,269, in view of Plavidal *et al.*, US Patent 5,718,795.

Since claim 4 depends from claim 1, which Applicants have argued *supra* to not be unpatentable over Deacon under 35 U.S.C. §102(b), Applicants maintain that claim 4 is likewise not unpatentable over Deacon in view of Plavidal under 35 U.S.C. §103(a).

Claims 5 and 10

The Examiner rejected claims 5 and 10 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Deacon *et al.*, US Patent 5,792,269.

Since claims 5 and 10 have been canceled, Applicants respectfully contend that the rejection of claims 5 and 10 under 35 U.S.C. § 103(a) is moot.

Claims 6 and 20

The Examiner rejected claims 6 and 20 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Deacon *et al.*, US Patent 5,792,269, in view of Mitani *et al.*, JP 3-281780.

Since claim 6 depends from claim 1, which Applicants have argued *supra* to not be unpatentable over Deacon under 35 U.S.C. §102(b), Applicants maintain that claim 6 is likewise not unpatentable over Deacon in view of Mitani under 35 U.S.C. §103(a).

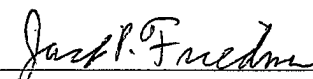
Since claim 20 depends from claim 17, which Applicants have argued *supra* to not be

unpatentable over Deacon under 35 U.S.C. §102(b), Applicants maintain that claim 20 is likewise not unpatentable over Deacon in view of Mitani under 35 U.S.C. §103(a).

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account 09-0456.

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